REMARKS

Claims 34-48 have been withdrawn from consideration as being directed to non elected subject matter.

REJECTION UNDER 35 U.S.C. §112

Claims 1-33 are rejected under 35 U.S.C. §112, second paragraph as being incomplete for omitting essential steps. The examiner asserts that "it is unclear what happen [when] the 'error' dispenser(s) that has been identify [sic] (i.e., is there a correction being perform [sic]?)."

The Applicants respectfully submit that there are not essential steps omitted from the claims and that the claims are clear. With respect to Claim 1 for example, in general Claim 1 specifies (b), (c) and (d) as follows: (b) generally specifies identifying an error in one or more dispensers; (c) generally specifies moving a first dispenser of each group and dispensing drops from non-error dispensers of each set of each group; and (d) generally specifies moving a second dispenser of the sets in each group to deposit drops from non-error dispensers of a set, i.e., from a non error second dispenser of a set in which an error first dispenser has been identified. The "correction" referred to by the Examiner is clearly indicated in the claims in that, if an error dispenser of a set of a group is identified, a non-error dispenser of the set in the group is moved along the selected path of the group to dispense drops because an error has been identified in a dispenser of the set and so drops are not dispensed therefrom. Accordingly, no steps are omitted in Claim 1. Claims 6 and 25 generally specify analogous steps and thus no steps are omitted in these claims either for reasons analogous to those described for Claim 1.

Accordingly, the Applicants respectfully submit that there are not steps omitted from the claims. As such, the Applicants respectfully request that this rejection be withdrawn.

REJECTION UNDER 35 U.S.C. §102

Claims 1-33 are rejected under 35 U.S.C. §102(a) as being anticipated by Agilent Technologies, Inc. (Agilent) (GB 2 355 716 A).

The enclosed declaration under 37 C.F.R. §1.131 demonstrates that the claimed subject matter of the present application was invented prior to February 5, 2001, the publication date of the cited reference.

As set forth in 37 C.F.R. § 1.131:

> (a) When any claim of an application or a patent under reexamination is rejected, the inventor of the subject matter of the rejected claim, the owner of the patent under reexamination, or the party qualified under §§1.42, 1.43, or 1.47, **may submit an appropriate declaration to establish invention of the subject matter of the rejected claim prior to the effective date of the reference** or activity on which the rejection is based...
>
> (b) **The showing of facts shall be such, in character and weight, as to establish reduction to practice prior to the effective date of the reference**, or conception of the invention prior to the effective date of the reference coupled with due diligence from prior to said date to a subsequent reduction to practice or to the filing of the application...
>
> (emphasis added)

As such, a 35 U.S.C. §102(a) rejection may be withdrawn if the Applicants can establish, by means of a declaration and a showing of facts, that the claimed subject matter was invented prior to the effective date of the cited reference.

In order to establish that the claimed invention was invented prior to the February 2, 2001 publication date of the cited reference, the Applicants herewith submit the declaration of the inventors of the instant application, Svetlana Shchegrova, William Fisher and Peter Webb, under 37 C.F.R. §1.131. This declaration provides a showing of facts that the inventors invented the claimed invention prior to February 5, 2001 in that the claimed inventions was reduced to practice prior to February 5, 2001.

Since the Applicants have provided a declaration and facts that show invention prior to February 5, 2001, the publication date of the cited reference, the rejection of Claims 1-33 under 35 U.S.C. §102(a) may be withdrawn.

REJECTION UNDER 35 U.S.C. §103

Claims 1-3, 5-19, 21-29 and 31-33 are rejected under 35 U.S.C. 103(a) as unpatentable over Brown et al. (US 5,807,522) and Tisone et al. (US 6,063,339).

Independent Claim 1, 6 and 25, from which claims 2-3, 5, 7-19, 21-24, 26-29 and 31-33 depend, specify a method of fabricating a chemical array that employs a head system with multiple groups of drop dispensers. Claims 6 and 25 further specify a head system in which the members of each group are arranged in multiple series extending in a first direction and multiple sets and Claim 25 further specifies that the multiple sets extend in a second direction sideways to the first direction. Accordingly, each of these claims, and the claims that depend therefrom, at least specifies a head system with multiple groups of drop dispensers.

Brown et al. do not teach or suggest a head system as claimed in any of these claims and in fact Brown et al. specifically describe a reagent dispensing device 10 that includes a single dispenser 12 having a single open capillary channel 14 that converges at a tip region 18. Tisone et al. fail to make up for the deficiency of Brown et al. as Tisone et al. describe a dispensing head 128. While Tisone et al. note that while only a single dispensing head is shown, it is contemplated that multiple dispensing heads may be used, Tisone et al. do not teach or suggest any head system with multiple groups of drop dispensers as Tisone et al. do not describe any grouping of drop dispensers at all. For at least this reason, the cited references fail to teach or suggest all the claimed elements of the subject claims.

Furthermore, the claims each specify loading dispensers of the head system with the same fluid. For example, Claim 1 specifies loading the dispensers with fluid such that each dispenser group has at least one set of redundant dispensers loaded with the same fluid. Claims 6 and 25 specify loading the dispenser with fluid such that dispensers within each set of the groups are loaded with the same fluid.

Neither Brown et al. nor Tisone et al. teach or suggest loading any dispensers with the same fluid. Since Brown et al. specifically teach only single dispensing device 10 having only a single opening, Brown et al. do not teach or even suggest loading any two or more dispensers with the same fluid. Tisone et al. again fail to make up for the deficiency of Brown et al. as Tisone et al. primarily describe a single dispensing head. Even though Tisone et al. notes that multiple dispensing heads may be used, Tisone et al. do not teach that any two or more of such multiple dispensing heads, if used, are loaded with the same fluid or that any other dispensers of a head system are loaded with the same fluid. For at least this reason, the cited references fail to teach or suggest all the claimed elements of the subject claims.

In making this rejection, the Examiner acknowledges that Brown et al. do not expressly teach a step of identifying an error dispenser and points to Tisone et al., asserting Tisone et al. describes identifying an error dispenser. However, Tisone et al. do not describe identifying an error dispenser at all and merely describe a controller 114 that can calculate a phase adjustment for each dispenser cycle. (col. 8, lines 27-30) The phase adjustment of Tisone et al. is with respect to advancing or retarding the timing of a valve 204 opening and closing so that a dispensed droplet 131 lands at a desired location on a substrate 111. (col. 8, lines 30-34), i.e., optimizing the parameters so that a droplet is positioned in a specific location. Accordingly, Tisone et al. is merely directed to controlling the timing of opening and closing of a valve. Tisone et al. do not describe error identification and instead merely describe evaluating various system input and output parameters and

behavioral characteristics that are factors relating to where a drop is finally deposited so that a phase adjustment may be determined: "the desired drop offset (if any), the vertical distance between the dispensing head nozzle 205 and the surface of the substrate 111, the velocity and/or acceleration of the dispensing head 128 and/or the substrate 111 relative to one another, the velocity of the dispensed droplets, ambient temperature and humidity, and other controlled and/or uncontrolled factors." (col. 8, lines 35-44) Once these parameters are evaluated, the desired phase adjustment can be determined. This is not analogous to any error of a dispenser but is simply determining the phase adjustment based on a variety of different factors.

However, even if Tisone et al. is characterized as describing an error identification method, Brown et al. and Tisone et al. still fail to teach all the claim limitations. For example, Claim 1 specifies moving a first dispenser of each set in each group along the selected path for that group while dispensing drops from non-error first dispensers of the sets in at least part of the pattern along the selected path for each group; and moving a second dispenser of the sets in each group along the selected path for that group while dispensing drops from a non-error second dispenser of a set having an identified error first dispenser, in at least part of the pattern for the selected path of the first group. However, no such process is described or suggested in Brown et al. or in Tisone et al.

In support of this rejection, the Examiner simply points to col. 8, lines 48-55 in which Tisone et al. describe that the precise phase adjustment can be determined experimentally for a given production set up either before or during production. Nowhere in the general description referred to by the Examiner, in which it is described that phase adjustment can be determined experimentally either before or during production, do Tisone et al. teach or suggest moving a first dispenser of each set in each group along the selected path for that group while dispensing drops from non-error first dispensers of the sets and moving a first dispenser of each set in each group along the selected path for that group while dispensing drops from non-error first dispensers of the sets, as claimed in Claim 1, as Tisone et al. is merely concerned with optimizing valve timing for a given dispensing cycle.

Likewise, Claim 6 specifies moving a first dispenser frame along the selected paths for the groups while dispensing drops from non-error dispensers of the first frame in at least part of the patterns along the selected paths for the groups and when an error dispenser is detected in the first frame, moving a further frame along the selected paths for the groups while dispensing drops from a non-error dispenser of the further frame located in the same set as the error dispenser, in at least part of the patterns along the selected paths for the groups. Nowhere in the general description referred to by the Examiner, in which it is described that phase adjustment can be determined experimentally either before or during production, do Tisone et al. teach or suggest moving a first dispenser frame

along the selected paths for the groups while dispensing drops from non-error dispensers of the first frame and when an error dispenser is detected in the first frame, moving a further frame along the selected paths for the groups while dispensing drops from a non-error dispenser of the further frame located in the same set as the error dispenser, as claimed in Claim 1, as Tisone et al. is merely concerned with optimizing valve timing for a given dispensing cycle.

Claim 25 specifies moving a first frame along the selected paths for the groups while dispensing drops from non-error dispensers of the first frame in at least part of the patterns along the selected paths for the groups; and when an error dispenser is detected in the first frame, then multiple selected frames are moved along the selected paths for the groups while dispensing drops from non-error dispensers of each of the frames in at least part of the patterns along the selected paths for the groups, wherein each of the frames so moved is selected as the frame among previously non-selected frames which has the highest number of non-error dispensers in sets not containing a non-error dispenser in a previously selected frame. Nowhere in the general description referred to by the Examiner, in which it is described that phase adjustment can be determined experimentally either before or during production, do Tisone et al. teach or suggest moving a first frame along the selected paths for the groups while dispensing drops from non-error dispensers of the first frame in at least part of the patterns along the selected paths for the groups; and when an error dispenser is detected in the first frame, then multiple selected frames are moved along the selected paths for the groups while dispensing drops from non-error dispensers of each of the frames in at least part of the patterns along the selected paths for the groups, wherein each of the frames so moved is selected as the frame among previously non-selected frames which has the highest number of non-error dispensers in sets not containing a non-error dispenser in a previously selected frame, as claimed in Claim 1, as Tisone et al. is merely concerned with optimizing valve timing for a given dispensing cycle.

Furthermore, there is no motivation to combine the microarray fabrication device and methods of Brown et al. with the device and phase adjustment methods of Tisone et al. because the device and method of Brown et al. are wholly different from the device and method of Tisone et al and do not require a phase adjustment. Differences include the manner in which fluid is transferred into the dispensing device for delivery at a substrate surface and the manner in which fluid is deposited from the device to a substrate surface. For example, Brown et al. describe a liquid loading method in which liquid is drawn into the channel of the dispenser by dipping the dispenser tip into the liquid and allowing filling by capillary into the dispenser channel. (col. 7, lines 55-58) Brown et al. describe that to deposit a drop of the liquid from the channel to a substrate, the tip of the dispenser is directly contacted with the substrate surface to deposit a droplet of liquid at the substrate surface

("...making momentary contact with the surface, in effect, tapping the tip of the dispenser against the support surface. (col. 8, lines 1-3)). In doing so, "The tapping movement of the tip against the surface acts to break the liquid meniscus in the tip channel, bringing the liquid in the tip into contact with the support surface. This, in turn, produces a flowing of the liquid into the capillary space between the tip and the surface, acting to draw liquid out of the dispenser channel." (col. 8, lines 3-9)

However, Tisone et al. describe a different fluid loading method all together in which fluid is held in a fluid reservoir 116 and a syringe pump 120 draws fluid 130 from the reservoir and provides it to the dispensing head 128 via supply tube 150. (col. 8, lines 1-17) The manner of depositing a droplet of fluid from the dispensing head onto a substrate surface is also wholly different from Brown et al. For example, the method of Tisone et al. requires a dispensing valve 204 positioned in the fluid channel of the dispensing head 128 (see for example Fig. 1) to meter an amount of fluid for deposition at a substrate surface site. Furthermore, the fluid deposition process of Tisone et al. does not include any direct contact of the dispensing head with the substrate (see for example col. 8, line39-40 discussing the vertical distance between the dispensing head nozzle and the surface of the substrate) and instead employs the dispensing valve noted above. Tisone et al. describe a method in which the dispensing operation takes place "on-the-fly, that is without stopping the motion of the X-Y table". It is because of this on-the-fly dispensing that Tisone et al. require a phase adjustment at all. (see, e.g., col. 8, lines 25-34) Accordingly, Brown et al. do not need a dispensing valve or phase adjustment process as described in Tisone et al., as the manners in which fluid is retained in the channel of Brown et al. (capillary forces) and the manner in which fluid is dispensed from the channel of Brown et al. (direct contact with the substrate) is wholly different from that described by Tisone et al. and the device and methods of Brown et al. do not require, nor is there any motivation to use, a dispensing valve or a phase adjustment process as described in Tisone et al.

Accordingly, for at least these reasons, Browne et al. and Tisone et al do not anticipate Claims 1-3, 5-19, 21-29 and 31-33. As such, the Applicants respectfully request that this rejection be withdrawn.

Claims 4, 20 and 30 are rejected under 35 U.S.C. 103(a) as unpatentable over Brown et al. (US 5,807,522) and Tisone et al. (US 6,063,339) and further in view of Gamble et al. (US 5,958,342).

Claims 4, 20 and 30 depend from Claims 1, 6 and 25, respectively. As described above, Brown et al. do not teach or suggest all of the limitations of Claims 1, 6 and 25. Gamble et al. fails to make up for the deficiencies of Brown et al, and Tisone et al., as Gamble et al. is cited solely for

specifying pulse jet dispensers. Accordingly, for at least these reasons, Claims 4, 20 and 30 are not anticipated by Browne et al. and Tisone et al., in further view of Gamble et al. As such, the Applicants respectfully request that this rejection be withdrawn.

DOUBLE PATENTING

Claims 1-33 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over Claims 1-13 of copending Application No. 09/628,470. In view of the attached Terminal Disclaimer, the Applicants respectfully request that this rejection be withdrawn.

CONCLUSION

In view of the remarks, this application is considered to be in good and proper form for allowance and the Examiner is respectfully requested to pass this application to issue.

The Commissioner is hereby authorized to charge any fees under 37 C.F.R. §§1.16 and 1.17 which may be required by this paper, or to credit any overpayment, to Deposit Account No. 50-1078, reference no. 10010464-1.

Respectfully submitted,

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Enclosures:

- Terminal Disclaimer
- Declaration under 37 C.F.R. §1.131

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